Water Reclamation and Reuse Regulation (9 VAC 25-740)

Aquaculture Enhancement Areas
Technical Advisory Committee
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DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Principle factors driving water reclamation and reuse in the U.S.

- Rapid growth rate in urban areas
- Alternative to effluent point source discharges

(EPA Guidelines for Water Reuse, 2004)

Basis for regulation provided in State Water Control Law

- § 62.1-44.2 – defines purpose of SWC Law to
  - Promote and encourage the reclamation and reuse of wastewater
  - Protect the environment and public health
- § 62.1-44.15:15 – Gives authority to the SWC Board to establish requirements for the reclamation and reuse of wastewater
- § 61.1-44.19. 12-19 – Chesapeake Bay Watershed Nutrient Credit Exchange Program:
  - Requires development of general VPDES permit to regulate total N and P discharges, and to provide nutrient trading mechanism within Chesapeake Bay watershed of Virginia
  - Recycle or reuse of wastewater - a means of reducing total N and P loads comparable to BNR technology

Water Reclamation and Reuse Regulation

- Part I - Definitions and General Program Requirements
- Part II - Reclaimed Water Standards, Monitoring Requirements and Reuses
- Part III - Application and Technical Requirements

Water Reclamation and Reuse Regulation

9 VAC 25-740-10 Definitions

Water Reclamation – the treatment of domestic, municipal or industrial wastewater or sewage to produce reclaimed water for a water reuse that would not otherwise occur

Reuse or Water Reuse – the use of reclaimed water for a direct beneficial use, an indirect potable reuse, or a controlled use in accordance with this regulation

Water Reclamation and Reuse Regulation

9 VAC 25-740-30 and 9 VAC 25-740-40

- Water reclamation and reuse will be implemented through existing VPDES and VPA Permit Programs
- Most end users will not be permitted, but will be required to enter into agreements or contracts with reclaimed water provider
- Permits will be required for existing unpermitted or new proposed facilities that are/will produce or distribute reclaimed water
- Grand fathering provision for existing permitted facilities producing, distributing or using reclaimed water – no permit application until expansion or modification

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9 VAC 25-740-50.A Exclusions

- Activities permitted by VDH
- Utilization of gray water
- Non-potable water produced and utilized by the same treatment works (other qualifying factors)
- Recycle flows within treatment works
- Industrial effluents or other water streams prior to final treatment used in re-circulation, recycle or reuse systems at the same industrial facility (other qualifying factors)
- Land treatment systems described by SCAT Regulations
- Indirect reuse excluding indirect potable reuse projects after effective date of regulation
- Existing indirect potable reuse projects
- Direct injection of reclaimed water into an aquifer authorized by UIC permit issued by EPA

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9 VAC 25-740-70 Standards for Reclaimed Water

- Level 1
- Level 2
- Industrial – determined on a case-by-case basis

Parameter	Standards for Reclaimed Water	
	Level 1	Level 2
Description of minimum treatment	Secondary treatment with filtration and higher level disinfection	Secondary treatment with standard disinfection
Fecal coliform or	Monthly geometric mean ≤ 14 colonies/100 ml; CAT > 49 colonies/100 ml	Monthly geometric mean ≤ 200 colonies/100 ml; CAT > 800 colonies/100 ml
E. coli or	Monthly geometric mean ≤ 11 colonies/100 ml; CAT > 35 colonies/100 ml	Monthly geometric mean ≤ 126 colonies/100 ml; CAT > 235 colonies/100 ml
Enterococci	Monthly geometric mean ≤ 11 colonies/100 ml; CAT > 24 colonies/100 ml	Monthly geometric mean ≤ 35 colonies/100 ml; CAT > 104 colonies/100 ml
Total Residual Chlorine	CAT < 1 mg/l after a minimum contact time of 30 minutes at average flow or 20 minutes at peak flow	CAT < 1 mg/l after a minimum contact time of 30 minutes at average flow or 20 minutes at peak flow
pH	6.0-9.0 standard units	6.0-9.0 standard units
BOD_5 or	Monthly average ≤ 10 mg/l	Monthly average ≤ 30 mg/l; maximum weekly average 45 mg/l
CBOD	Monthly average ≤ 8 mg/l	Monthly average ≤ 25 mg/l; maximum weekly average 40 mg/l
Turbidity	Daily average of discrete measurements recorded over a 24-hour period ≤ 2 NTU; CAT > 5 NTU	
Total Suspended Solids (TSS)		Monthly average ≤ 30 mg/l; maximum weekly average 45 mg/l

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9 VAC 25-740-90.A Minimum Standard Requirements for Reuses

6 Reuse Categories

1. Urban - Unrestricted Access (Level 1)
2. Irrigation - Unrestricted Access (Level 1)
3. Irrigation - Restricted Access (Level 2)
4. Landscape Impoundments (Level 1 or 2)
5. Construction (Level 2)
6. Industrial (Level 1 or 2)

Reuse Category	Reuse	Minimum Standard Requirements[a.]
1. Urban – Unrestricted Access	All types of landscape irrigation in public access areas (i.e., golf courses, cemeteries, public parks, school yards and athletic fields) Toilet flushing – non-residential Fire fighting or protection and fire suppression in non-residential buildings Outdoor domestic or residential reuse (i.e., lawn watering and non-commercial car washing) Commercial car washes Commercial air conditioning systems	Level 1
2. Irrigation – Unrestricted Access	Irrigation for any food crops not commercially processed, including crops eaten raw	Level 1
3. Irrigation – Restricted Access[b.]	Irrigation for any food crops commercially processed	Level 2
	Irrigation for non-food crops and turf, including fodder, fiber and seed crops; pasture for foraging livestock; sod farms; ornamental nurseries; and silviculture	

a. For reclaimed industrial wastewater, minimum standards required shall be determined on a case-by-case basis relative to the proposed reuse or reuses.
b. For irrigation with reclaimed water treated to Level 2, the following shall be prohibited unless Level 1 disinfection is provided:
    1. Grazing by milking animals on the irrigation reuse site for 15 days after irrigation with reclaimed water ceases, and
    2. Harvesting, retail sale or allowing access by the general public to ornamental nursery stock or sod farms for 14 days after irrigation with reclaimed water ceases.

Reuse Category	Reuse	Minimum Standard Requirements[a.]
4. Landscape Impoundments	Potential for public access or contact	Level 1
	No Potential for public access or contact	Level 2
5. Construction[c.]	Soil compaction Dust control Washing aggregate Making concrete	Level 2
6. Industrial[c.]	Commercial laundries	Level 1
	Livestock watering[d.] Aquaculture[e.] Stack scrubbing Street washing Boiler feed Ship ballast Once-through cooling Recirculating cooling towers	Level 2

c. Worker contact with reclaimed water treated to Level 2 shall be minimized. Level 1 disinfection shall be provided when worker contact with reclaimed water is likely.
d. Level 1 disinfection shall be provided when the reclaimed water is consumed by milking livestock.
e. Level 1 disinfection shall be provided for aquaculture production of fish to be consumed raw, such as for sushi.

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Groundwater Recharge and Aquifer Storage & Recovery (ASR)

- Not included among listed reuses
- DEQ conducting statewide groundwater characterization - needed to determine feasibility of groundwater recharge & ASR
- DEQ may consider in future amendments to the regulation

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9 VAC 25-740-100 Application for permit

- General information – for reclamation systems and reclaimed water distribution systems
- Reclaimed Water Management (RWM) Plan – for provider of reclaimed water to end user or self
  - Description and map of service area
  - Inventory of reclaimed and reject water storage
  - Water balance – reclaimed water generated, stored, reused and discharged
  - Example service agreements or contracts
  - Education and notification program (Level 1)
  - Cross-connection & backflow prevention program
  - NMP requirements for irrigation reuse
  - Site plans for bulk irrigation reuse sites

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- All irrigation reuse is supplemental irrigation
  - Irrigation, which in combination with rainfall, meets but does not exceed the water necessary to maximize production or optimize growth of the irrigated vegetation
- Supplemental irrigation vs. land treatment
  - Supplemental irrigation - strictly reuse
  - Land treatment - primarily treatment and disposal, secondarily planned or unplanned reuse (Sewage Collection and Treatment Regulations, 9 VAC 25-790)

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Remaining Regulation Milestones and Implementation

- Adoption of the final regulation – Spring 2008
- Staff recommendations on 9VAC25-740-105 to the Board - June 2008
- Development of implementation guidance - Summer 2008

Alternatives to Point Source Discharges

- **Treatment & Disposal**
  - Decentralized – On-site treatment & disposal (VDH)
  - Centralized
    - Mass Drainfields (VDH)
    - Land Treatment (DEQ)
- **Water Reuse**
  - Centralized
    - Reclamation of wastewater (industrial and municipal) for water reuse (DEQ)
- **Combination**

Nutrient Management for DEQ Alternatives

Some form of nutrient management required

- **Irrigation reuse of reclaimed water**
  - **For only use of non-BNR reclaimed water**
  - **Bulk irrigation – NMP required**
  - **Non-bulk irrigation – no NMP, but other measures required**
- **Land treatment**
  - **Nutrient treatment limits imposed in permit**
  - **NMP may be required determined by type of land treatment**

Advantages / Disadvantages

Water Reuse

- **Advantages – eliminates or reduces nutrient load to surface water depending on reuse; conserves highest quality water (potable) for public consumption; no groundwater monitoring**
- **Disadvantage – reclaimed water distribution system will be expensive; irrigation reuse will be at much lower rates than for land treatment; does not include groundwater recharge**

Land Treatment

- **Advantages – allows for higher rates of effluent land application and disposal; less storage; no or limited distribution and related costs**
- **Disadvantages – requires ground water monitoring; must comply with Antidegradation Policy for Groundwater (9VAC25-280-30); may require coordination with and/or permitting by EPA if considered groundwater injection**

Design Considerations

- Water reclamation design must, at a minimum, meet reclaimed water standards in the regulation (9VAC25-740) relative to the intended reuses of that water
- Land Treatment design must, at a minimum, meet secondary treatment before land application, but could require significantly more treatment determined by existing or potential impacts to groundwater resulting from the system (Antidegradation Policy for Groundwater)

Questions?